REMARKS

No claims have been canceled, amended or added in this paper. Therefore, claims 1-28 are pending and are under active consideration.

Claims 1-28 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over Tennies et al (5,185,685) in view of Neuhoff (4,067,052)." In support of the rejection, the Patent Office states the following with respect to sole independent claim 1:

> As to claim (1), Tennies et al disclose (fig. 1, fig. 2) at least one electrical conductor (46, 48, 50) formed as a single wire or multi-wire line or cable (46-50), which connects devices, subassemblies or circuits components (30, 54, 58, 60) of the piece of electrical equipment on one another, means (38) which guides the light that emerges when an arc is formed from the site of its formation to an optical/electrical transformer (26) and a monitoring and evaluating unit (62) electrically connected to the transformer (26) for evaluating the signals of transformer (26), is characterized in that the means (38) which guide the light that emerges when an arc is formed to an optical/electrical transformer (26) involve at least one conduit (38) which envelopes one or more wire cores of the electrical conductors (46-50) and thus simultaneously forms the electrical insulation of a line or the shielding of a cable, (column 3, lines 22-35, lines 45-57). Tennies et al is silent for explicitly disclosing an optical fiber. Neuhoff discloses (fig. 3) to provide for assured and more rapid conveyance of the light emanating from an arcing fault, fiber optics may be utilized, for instance those fiber optics bundles represented at (136-140), extending to points of fault failure. Neuhoff also discloses that fiber optic bundles for use in such situations are known and available from such sources as Dolan-Jenner Industries, Inc. (column 7, lines 20-33). It would have been obvious for one of ordinary skill in the art to modify Tennies et al in view of Neuhoff to use the fiber optic bundle to envelope one or more wire cores of the electrical conductors to form the insulation and to improve the transmitting of arc faults at a faster rate by generating an electrical signal to open the circuit breaker in order to prevent damage to the equipment.

Applicant respectfully traverses the subject rejection. Claims 2-28 depend from claim 1. Claim 1 is patentable over Tennies et al. in view of Neuhoff for at least the reasons below.

At the outset, Applicant respectfully submits that the Patent Office has predicated the subject rejection on a misreading of the apparatus for arc detection described in Tennies et al. In particular, it appears that the Patent Office is taking the position that Tennies et al. discloses a device or apparatus which covers all elements of the claimed arrangement, except for the optical fiber which guides the light of an arc from the site of its formation to the optical/electric transformer. However, at the same time, the Patent Office is apparently regarding conduit 38 of Tennies et al. as "...means (38) which guides the light that emerges when an arc is formed from the site of its formation to an optical/electrical transformer (26)..." These positions of the Patent Office are incompatible with and contradict one another.

Moreover, neither the means (38) of Tennies et al. nor the transformer (26) of Tennies et al. is an optical/electrical transformer. This fact is not surprising insofar as for detection of an arc according to Tennies et al. not the light of the arc is interpreted directly but the electromagnetic field which arises by occurrence of an arc (see abstract and detailed description of the apparatus with respect to Figs. 1 and 2 – column 3, line 46 to column 4, line 20).

Looking at Figs. 1 and 3 of Tennies et al., one of ordinary skill in the art would have noted immediately that transformer (26) is not an optical/electrical transformer, but rather, is a transformer for transforming a voltage level to another with the function of a voltage source supplying a current distribution circuit (20) with the needed voltage level. Applicant's position is supported by the

description at col. 3, line 19, of Tennies et al. There is nothing in Tennies et al. that would have suggested to a person of ordinary skill in the art that transformer (26) could transform an optical signal into an electrical signal in view of the described embodiment. Likewise, there is nothing in Tennies et al. that would have suggested to a person of ordinary skill in the art that means (38) is able to guide light in any way. It also does not make any sense to take the position that means (38) could transmit any other kind of signal which gives a feedback of occurrence of a stray light arc. Instead, means (38) is a conduit only comprising electrical wires (46, 48, 50), respectively, an ordinary electrical cable comprising a line wire (46), a neutral wire (48) and a wire connected to ground (50). Wires (46, 48) of this electrical cable connect electrical outlets (40, 42) for plugging an electrical load with the current distribution circuit (20) which is supplied by the voltage source (26). With respect to this, the current distribution circuit (20) is monitored for occurrence of stray light arcs and/or overloads. However, the occurrence of arcs is detected not by using optical means but by sensing the electromagnetic field caused by the arc with an antenna transducer (62) comprising E (electric) field sensor 66 and a B (magnetic) field sensor 68 (see Tennies et al. at col. 4, lines 4-20). The only optical element mentioned in Tennies et al. is an optocoupler (see Fig. 9) comprising an LED (644) and a light responsive transistor (646) which serves to galvanic decouple a discriminator from following circuits as part of the described apparatus whereas the discriminator serves for discriminating between acceptable and unacceptable arcs. Consequently, Tennies et al. does not represent a closer state of the art than EP 0 575 932 A1, which, as discussed in the present specification, describes a similar method for detection of arcs by sensing the caused magnetic field.

Neuhoff discloses a process for detecting electrical faults where occurring stray light arcs are detected by using optical means, respectively, a photoresponsive device (cell 130). Neuhoff teaches the use of fiber optics to guide light of arcs to the cell (130). As far as Neuhoff states (in column 7, lines 5 to 10 with respect to fig. 4) that the fiber optics serve to provide for assured and more rapid conveyance of the light, the latter is disputable. In any case, this conclusion makes no sense in connection with the argument to carry using the fiber optics described in Neuhoff to Tennies et al. What should become faster by using fiber optics in the apparatus of Tennies et al. -

- the conveyance of the electromagnetic field caused by an arc to the antenna transducer (62)? or
- the movement of arc light which would move through the air in absence of fiber optics?

Both an electric field, as well as light, moves much faster in air (namely, at approximately 300,000 km/s in a vacuum) than light in a fiber optic, which moves at approximately 200,000 km/s in a glass fiber.

What Neuhoff actually teaches is an assured conveyance of the light and a quicker activation of the photoresponsive cell (30) by placing fiber optics which extend to points of probable failure (which points could be in a detecting shadow or at least partially shadowed in the absence of such fiber optics). Nevertheless, in any case, the light of an arc which occurs in the cabinet (10) passes parts of the interior space of this cabinet (10) before entering the container (142) "...disposed on a side of the electrical equipment being monitored..." (col. 7, lines 12, 13) and containing the photoresponsive cell or before entering the optical fibers in the container (142). In connection with this point, it has to be noted that the light of an arc enters a fiber optic in an arrangement like that

disclosed in Neuhoff in any case from outside the fiber and, thereby, only in an ideal case across the front face of such a fiber. That means the light enters the fiber optics with a loss of intensity.

Contrary to this, the light that occurs by formation of an arc on the conductor (1) of the arrangement concerning the present invention enters the optical fiber (2), in the worst case, across the front face or, more advantageously, the light even emerges inside optical fiber (2) normally because the optical fiber (2) surrounds the conductor (1). Therefore, the light is transmitted to the optical/electrical transformer (3) with significantly less loss of intensity. More precisely, in the present invention, the optical fiber (2) is a part of a cable comprising a conductor (1) and an optical fiber (2) which optical fiber (2) forms an insulating cladding for the conductor (1) simultaneously. In this capacity, the optical fiber (2) is moreover a part of the electrical equipment to be observed concerning the occurrence of stray light arcs and a part of the arrangement which is used for this observation simultaneously. As a result of this, the present invention results in arc detection that is more reliable than the solutions known from the state of the art and should even be more reliable than the arrangement described in Neuhoff.

In short, neither Tennies et al. nor Neuhoff discloses an apparatus or an arrangement using a optical fiber for guiding the light of a stray light arc to a detector which optical fiber is an insulator of a conductor or electrical cable simultaneously and which is therefore a part of the electrical equipment which is to be observed concerning the occurrence of stray light arcs, as well as a part of the arrangement which is used for this observation. It is also not comprehensible how one of

ordinary skill in the art would have come to the present invention by combining Tennies et al. and Neuhoff. Therefore, the claimed invention is patentable over Tennies et al. in view of Neuhoff.

Accordingly, for at least the above reasons, the subject rejection should be withdrawn.

In conclusion, it is respectfully submitted that the present application is in condition for allowance. Prompt and favorable action is earnestly solicited.

If there are any fees due in connection with the filing of this paper that are not accounted for, the Examiner is authorized to charge the fees to our Deposit Account No. 11-1755. If a fee is required for an extension of time under 37 C.F.R. 1.136 that is not accounted for already, such an extension of time is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on December 9, 2008.

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